

used in this transmitter must be replaced (or recharged, if the battery is rechargeable) when the transmitter has been in use for more than 1 cumulative hour, or when 50 percent of their useful life (or for rechargeable batteries, 50 percent of their useful life of charge) has expired, as established by the transmitter manufacturer under its approval. The new expiration date for replacing (or recharging) the battery must be legibly marked on the outside of the transmitter. The battery useful life (or useful life of charge) requirements of this paragraph do not apply to batteries (such as water-activated batteries) that are essentially unaffected during probable storage intervals.

(c) Enough survival kits, appropriately equipped for the route to be flown for the number of occupants of the airplane.

[Doc. No. 6258, 29 FR 19205, Dec. 31, 1964, as amended by Amdt. 121-79, 36 FR 18724, Sept. 21, 1971; Amdt. 121-106, 38 FR 22378 Aug. 20, 1973; Amdt. 121-158, 45 FR 38348, June 9, 1980; Amdt. 121-239, 59 FR 32057, June 21, 1994; Amdt. 121-251, 60 FR 65932, Dec. 20, 1995]

§ 121.354 Terrain awareness and warning system.

(a) *Airplanes manufactured after March 29, 2002.* No person may operate a turbine-powered airplane unless that airplane is equipped with an approved terrain awareness and warning system that meets the requirements for Class A equipment in Technical Standard Order (TSO)-C151. The airplane must also include an approved terrain situational awareness display.

(b) *Airplanes manufactured on or before March 29, 2002.* No person may operate a turbine-powered airplane after March 29, 2005, unless that airplane is equipped with an approved terrain awareness and warning system that meets the requirements for Class A equipment in Technical Standard Order (TSO)-C151. The airplane must also include an approved terrain situational awareness display.

(Approved by the Office of Management and Budget under control number 2120-0631)

(c) *Airplane Flight Manual.* The Airplane Flight Manual shall contain appropriate procedures for—

(1) The use of the terrain awareness and warning system; and

(2) Proper flight crew reaction in response to the terrain awareness and warning system audio and visual warnings.

[Doc. No. 29312, 65 FR 16755, Mar. 29, 2000]

§ 121.355 Equipment for operations on which specialized means of navigation are used.

(a) No certificate holder may conduct an operation—

(1) Using Doppler Radar or an Inertial Navigation System outside the 48 contiguous States and the District of Columbia, unless such systems have been approved in accordance with appendix G to this part; or

(2) Using Doppler Radar or an Inertial Navigation System within the 48 contiguous States and the District of Columbia, or any other specialized means of navigation, unless it shows that an adequate airborne system is provided for the specialized navigation authorized for the particular operation.

(b) Notwithstanding paragraph (a) of this section, Doppler Radar and Inertial Navigation Systems, and the training programs, maintenance programs, relevant operations manual material, and minimum equipment lists prepared in accordance therewith, approved before April 29, 1972, are not required to be approved in accordance with that paragraph.

[Doc. No. 10204, 37 FR 6464, Mar. 30, 1972]

§ 121.356 Collision avoidance system.

Effective January 1, 2005, any airplane you operate under this part must be equipped and operated according to the following table:

COLLISION AVOIDANCE SYSTEMS	
If you operate any—	Then you must operate that airplane with—
(a) Turbine-powered airplane of more than 33,000 pounds maximum certificated takeoff weight.	(1) An appropriate class of Mode S transponder that meets Technical Standard Order (TSO) C-112, or a later version, and one of the following approved units: (i) TCAS II that meets TSO C-119b (version 7.0), or takeoff weight a later version.

COLLISION AVOIDANCE SYSTEMS—Continued

If you operate any—	Then you must operate that airplane with—
	<p>(ii) TCAS II that meets TSO C–119a (version 6.04A Enhanced) that was installed in that airplane before May 1, 2003. If that TCAS II version 6.04A Enhanced no longer can be repaired to TSO C–119a standards, it must be replaced with a TCAS II that meets TSO C–119b (version 7.0), or a later version.</p> <p>(iii) A collision avoidance system equivalent to TSO C–119b (version 7.0), or a later version, capable of coordinating with units that meet TSO C–119a (version 6.04A Enhanced), or a later version.</p>
(b) Passenger or combination cargo/passenger (combi) airplane that has a passenger seat configuration of 10–30 seats.	<p>(1) TCAS I that meets TSO C–118, or a later version, or</p> <p>(2) A collision avoidance system equivalent to has a TSO C–118, or a later version, or</p> <p>(3) A collision avoidance system and Mode S transponder that meet paragraph (a)(1) of this section.</p>
(c) Piston-powered airplane of more than 33,000 pounds maximum certificated take-off weight.	<p>(1) TCAS I that meets TSO C–118, or a later version, or</p> <p>(2) A collision avoidance system equivalent to maximum TSO C–118, or a later version, or</p> <p>(3) A collision avoidance system and Mode S transponder that meet paragraph (a)(1) of this section.</p>

[Doc. No. FAA–2001–10910, 68 FR 15902, Apr. 1, 2003]

§ 121.357 Airborne weather radar equipment requirements.

(a) No person may operate any transport category airplane (except C–46 type airplanes) or a nontransport category airplane certificated after December 31, 1964, unless approved airborne weather radar equipment has been installed in the airplane.

(b) [Reserved]

(c) Each person operating an airplane required to have approved airborne weather radar equipment installed shall, when using it under this part, operate it in accordance with the following:

(1) *Dispatch.* No person may dispatch an airplane (or begin the flight of an airplane in the case of a certificate holder, that does not use a dispatch system) under IFR or night VFR conditions when current weather reports indicate that thunderstorms, or other potentially hazardous weather conditions that can be detected with airborne weather radar, may reasonably be expected along the route to be flown, un-

less the airborne weather radar equipment is in satisfactory operating condition.

(2) If the airborne weather radar becomes inoperative en route, the airplane must be operated in accordance with the approved instructions and procedures specified in the operations manual for such an event.

(d) This section does not apply to airplanes used solely within the State of Hawaii or within the State of Alaska and that part of Canada west of longitude 130 degrees W, between latitude 70 degrees N, and latitude 53 degrees N, or during any training, test, or ferry flight.

(e) Notwithstanding any other provision of this chapter, an alternate electrical power supply is not required for airborne weather radar equipment.

[Doc. No. 6258, 29 FR 19205, Dec. 31, 1964, as amended by Amdt. 121–18, 31 FR 5825, Apr. 15, 1966; Amdt. 121–130, 41 FR 47229, Oct. 28, 1976; Amdt. 121–251, 60 FR 65932, Dec. 20, 1995]

§ 121.358 Low-altitude windshear system equipment requirements.

(a) *Airplanes manufactured after January 2, 1991.* No person may operate a turbine-powered airplane manufactured after January 2, 1991, unless it is equipped with either an approved airborne windshear warning and flight guidance system, an approved airborne detection and avoidance system, or an approved combination of these systems.

(b) *Airplanes manufactured before January 3, 1991.* Except as provided in paragraph (c) of this section, after January 2, 1991, no person may operate a turbine-powered airplane manufactured before January 3, 1991 unless it meets one of the following requirements as applicable.

(1) The makes/models/series listed below must be equipped with either an approved airborne windshear warning and flight guidance system, an approved airborne detection and avoidance system, or an approved combination of these systems:

- (i) A–300–600;
- (ii) A–310—all series;
- (iii) A–320—all series;
- (iv) B–737–300, 400, and 500 series;
- (v) B–747–400;
- (vi) B–757—all series;